Section 4 – Improved Clinic Practices Around Asthma Control

This is a collaborative report coauthored by the Evaluation Team at Group Health Community Foundation, with others involved in the process, including: the AAA Project Director, Co-Director, and Project Manager/KCAF Coordinator.

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Summary

Several Allies Against Asthma (AAA) activities focused on improving clinical asthma management, including the Learning Collaborative (LC), asthma registry, care coordination by the Community Health Workers (CHW) and other activities. Many of the activities continue after AAA funding has ended, including clinic improvements brought about through the learning collaborative and the asthma registry. The KCAF played an important role in supporting the clinic improvement activities.

Key accomplishments:

- **Learning Collaborative.** Four safety-net clinics used a modified version of the Institute for Health Care Improvement collaborative model to improve the quality of asthma care. Three of the clinics (those with more consistent top management support) made significant improvements: forming improvement teams with active clinical champions, actively testing changes, using asthma registries and beginning to spread improvements to other provider practices in their clinics. Asthma registry data showed increases in the use of controller medications and in the percent of visits where the asthma severity level was assessed**.** There were a number of lessons learned in the process related to program design, planning, and implementation (described below) that may prove useful for other clinics implementing learning collaboratives.

- **Asthma Registry.** AAA supported development of an asthma registry at five clinic sites and one City of Seattle site through provision of computers, software, technical assistance and funding of a registry manager. The registry collects data on components of care specified by current guidelines and/or desired by clinicians. The system uses the data to prepare patient management summaries for each clinic visit, which are then updated after the visit.

- **Care Coordination.** AAA Community Health Workers (CHWs) assisted clinicians in improving care for children with asthma by coordinating services and community resources, providing case management, coaching clients in provider-patient communication, and providing support for self-management.

- **Spriometry Training.** AAA assisted five clinics in implementing pulmonary function testing (spirometry) by providing resources and training. Spirometry is an important tool for accurately assessing asthma severity and for diagnosing asthma.

- **Provider Education.** In 2004, AAA provided three pediatric asthma "Evidence to Practice" presentations to 40 Harborview Medical Center physicians, 45 community health clinic providers, and 40 public health nurses. In addition, the chronic disease coordinator from a Learning Collaborative clinic was funded to participate in the Asthma Educator Institute.

- **Other Clinic Improvement Activities.** During 2003-2004 the Community Health Plan of Washington (CPHW) partnered with an organization of community health centers and KCAF to improve clinic-based asthma care for patients cared for by network providers, with an emphasis on increasing controller medication treatment for patients with persistent asthma.

Overview of AAA Clinic Improvement Activities

Actual clinical practice often deviates from recommended clinical practice guidelines and evidence-based asthma management practice. King County Asthma Forum (KCAF) through its Allies Against Asthma project carried out a number of activities in clinics to bring actual practice closer to best practice. Four safety-net clinics that participated fully in these activities were Sea Mar Community Health Center, Rainier Beach Medical Center, Columbia Public Health Center, and Roxbury Family Healthcare-Highline Medical Group. The Eastside Community Health Clinic was participating but dropped out. Harborview Pediatric Clinic was involved in partial activities, and the North Public Health Center participated in some activities.

There were several AAA activities focused on improving clinical asthma management, including the Learning Collaborative (LC), Asthma Registry, care coordination by the Community Health Workers (CHW) and a project with a local community health plan. This section gives a brief overview of those activities.

Learning Collaborative

The primary strategy used by AAA to improve asthma care was based on an adaptation of the Learning Collaborative approach developed by the Institute for Health Care Improvement (IHI) (http://www.ihi.org/) (described further below) The goal of this Collaborative is to improve the quality of care delivered to children with asthma in an evidence-based manner through a collective learning process and technical assistance. Clinics assess current quality of care, identify areas for improvement and implement system-level improvements that focus on assuring the delivery of evidence-based clinical care and the provision of strong support for family education and self-management. A second goal is to enhance the linkages between clinical care and supportive resources in the community for people with asthma. Community resources include Community Health Workers, education programs for families, child care sites and schools, and Neighborhood Asthma Committees.

The Collaborative uses three "models" to generate learning and improvement: the Chronic Care Model, the Model for Improvement, and the Learning Model. The Chronic Care Model, developed by Wagner and colleagues[1],[2] provides a framework for quality improvement efforts. Implementation of the Chronic Care Model is being promoted by application of the rapid cycle plan-do-study-act (PDSA) approach developed by the Institute for Healthcare Improvement (IHI) [3,4,5] supported by expert consultation and cross-clinic interaction**.** The Learning Model is a 12-15

[1] Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness. JAMA. 2002;288:1775-9.
[2] Bodenheimer T, Wagner EH, Grumbach K. Improving primary care for patients with chronic illness: the chronic care model. JAMA. 2002;288:1909-14.
[3] Wagner EH, Glasgow R, Davies C, Bonomi AE, McCulloch D, Provost L, Carver P. Quality improvement in diabetes care: A collaborative approach. Joint Commission on Quality 2001;27:63-80.
[4] www.ihi.org
[5] Langley G, Nolan K, Nolan T, Norman C, Provost L. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*. San Francisco, CA: Jossey-Bass Publishers; 1996.

month schedule of intensive learning in a collaborative setting interspersed with action periods in the health center setting.

From Fall 2002 through the end of 2004, four clinics used the collaborative model to improve the quality of asthma care. Three of the clinics made significant improvements: forming improvement teams with active clinical champions, actively testing changes, using asthma registries and beginning to spread improvements to other provider practices in their clinics. AAA supported 0.15 FTE of a clinician-leader's time at each site to serve as the clinic asthma champion. The champion led a team effort to implement the IHI model and incorporate improved practices into clinic operations. Asthma champions received technical support from the AAA Asthma Management Coordinator (AMC) who served as the quality improvement consultant. As of August 2005, two clinics are sustaining significant improvements; one is addressing sustainability challenges and another is still in the implementation phase.

Learning among and from other teams and peers in the collaborative was a powerful factor in achieving results and spreading improvement to others. Clinics participated in regular bi-monthly gatherings to share strategies, resources, and lessons learned. Technical assistance was provided through site visits. Each month, clinics reported on improvement activities and measures of quality of care. These reports were shared among participating clinics via a listserv.

In addition to supporting the Learning Collaborative, during 2003 the KCAF began exploring methods for providing resources and education that were effective but did not require the efforts of a full-scale Learning Collaborative. They conducted an assessment of healthcare providers attending the Asthma Educator Institute (AEI) to identify asthma training needs and interests.

Asthma Registry

A critical tool in providing excellent care for chronic diseases is a clinical tracking system. AAA supported development of an asthma registry at four Learning Collaborative clinic sites and one City of Seattle site (North Public Health Center) through provision of computers, software, technical assistance and funding of a 0.1 FTE registry manager (who enters data, prepares reports and adds registry data to clinical charts). One clinic opted to use its own software, since it planned to develop a system-wide registry.

The registry collects data on components of care (such as severity assessments, use of inhaled steroids, and use of asthma action plans) and outcomes of care (number of symptom days) specified by current guidelines and/or desired by clinicians. The system uses the data to prepare patient management summaries for each clinic visit, which are then updated after the visit. These summaries permit assessment as to whether care is in conformance with guidelines. The registry also describes adherence to guidelines for the entire clinic population of patients with asthma in order to facilitate identification of targets for quality improvement. Registry data also serves as a source of evaluation data for the AAA project.

Three of the four participating clinics have dedicated resources to sustain their registries, data entry, and asthma champion time in 2005. AAA funding for the registries ended in 2004, although limited technical support was provided through June 2005. The four Learning

Collaborative clinics have committed staff and resources toward long-term management of the registry. This includes one clinic that received funding from King County STEPS to Health to support the registry through 2008.

Other Activities: CHWs, Spirometry, and the Community Health Plan of Washington Project

AAA Community Health Workers (CHWs) assisted clinicians in improving care for children with asthma by coordinating care with community resources, providing case management, coaching clients in provider-patient communication and providing support for self-management. As patients learn appropriate self-management skills they are better able to request appropriate assistance from their providers.

AAA assisted five clinics (the Learning Collaborative clinics and North Public Health Center) in implementing pulmonary function testing (spirometry) by providing resources and training. Spirometry is an important tool for accurately assessing asthma severity and for diagnosing asthma.

In 2003 the Community Health Plan of Washington (CPHW) partnered with an organization of community health centers (CHC's) and KCAF to improve clinic-based asthma care for health plan enrollees cared for by network providers. The catalyst was the health plan's performance on the HEDIS asthma measure regarding controller medication treatment for patients with persistent asthma. This project took a broader view to understand and act upon what prevents optimal care. It is anticipated that improvements resulting from this project will extend to patients in other clinics in the CHC organization.

In 2004, AAA provided three pediatric asthma "Evidence to Practice" presentations to clinicians: 40 Harborview Medical Center physicians, 45 community health clinic providers, and 40 public health nurses.

Learning Collaborative: Design, Implementation, Refinement

The AAA Learning Collaborative was designed initially to follow the model developed by the Institute for Healthcare Improvement. After some challenges relating to resources and feedback from participants, the AAA Learning Collaborative adopted a modified structure. This section describes the IHI model and how it was adapted by AAA, challenges that arose in implementing the model, and the model that ultimately emerged. Lessons learned are presented that may help other clinics conduct similar efforts in the future.

IHI Model[1]

The Health Disparities Collaboratives provide a proactive way of caring for people

[1] The description in this section is taken from the IHI web site: Institute for Healthcare Improvement. Training Manual, Health Disparities Collaboratives. http://www.healthdisparities.net/hdc/content/chronic_Apr2002.pdf Last accessed: April 15, 2005

with chronic illness. At the heart of this approach are three models:

- A Learning Model makes health centers part of a network of experts and fellow-learners.
- A Care Model outlines all of the elements of good chronic care.
- An Improvement Model enables teams to rapidly test and implement changes to improve care.

The **Learning Model** involves bringing together health center teams for intensive learning from experts and one another. In the Learning Sessions interdisciplinary teams from each health center attend three highly interactive two-day Learning Sessions, where they learn the elements of good care for patients with a particular chronic illness—diabetes, asthma, depression, HIV, cardiovascular disease—and a method for testing and implementing changes.

The Action Periods take place between the Learning Sessions. During Action Periods, teams try out these changes in their health centers—and collect data to measure the impact of the changes. They submit monthly progress reports and are supported by conference calls, site visits, and a web-based information network called a Listserv that allows them to share information and learn from national experts and other health centers across America. They also receive additional coaching from highly experienced Cluster Directors and information systems experts.

The **Care Model** includes six elements designed to create a system that is proactive and focused on keeping people as healthy as possible. In order to transform the system of care, health centers need to work on these six elements:

- *Self-Management.* Patients have a central role in determining their care, one that fosters a sense of responsibility for their own health.
- *Decision Support.* Health centers creatively integrate explicit, proven guidelines into the day-to-day practice of the primary care providers in an accessible and easy-to-use manner.
- *Clinical Information System.* A registry—an information system that can track individual patients as well as populations of patients—is a necessity when managing chronic illness or preventive care. The entire care team uses the registry to guide the course of treatment, anticipate problems, and track progress.
- *Delivery System Design.* The delivery of patient care requires not only determining what care is needed, but clarifying roles and tasks to ensure the patient gets care; making sure that all the clinicians who take care of a patient have centralized, up-to-date information about the patient's status; and making follow-up a part of standard procedure.
- *Organization of Health Care.* The effort to improve care should be woven into the fabric of the organization and aligned with a quality improvement system.
- *Community.* Community programs and organizations that can support or expand a health system's care for chronically ill patients and prevention strategies are often overlooked. To improve the health of the population, health centers reach out to form powerful alliances and partnerships with state programs, local agencies, schools, faith organizations, businesses, and clubs.

The **Improvement Model** defines how to test and implement changes in a fast and efficient way. The Improvement Model consists of three fundamental questions and a Plan-Do-Study-Act cycle to test and implement changes in real work settings.

- *Setting Aims.* An aim is a written statement summarizing what your health center's team hopes to achieve.

- *Defining Measures.* Measures play an important role in your efforts to improve care. They tell you whether a change actually leads to improvement.
- *Testing Changes.* All improvement requires changes, but not all changes result in improvement. It is therefore important to identify promising changes.

Linking PDSA Cycles The completion of each PDSA cycle leads directly into the start of the next cycle. A team learns from the test. What worked and what didn't work? What should be kept, changed, or discarded? A team uses the new knowledge to plan the next test. The team continues linking PDSA cycles in this way, refining the change until it is ready for broader implementation. Often, a team will test more than one change at a time, each change aimed at achieving the same ultimate goal. The use of several linked cycles will allow the team to test more than one change simultaneously.

AAA Implementation of Learning Collaborative Model

The AAA Learning Collaborative was modeled on IHI's Learning Collaborative model described in the previous section. The AAA LC made some modifications of the model in order to adapt them to the local context. Modifications included:

- Number of teams: The AAA LC had four teams; IHI considers 15-20 teams optimal to achieve sufficient interaction and cross-clinic sharing and collaboration.
- Staffing and financial resources: The LC staffing was much lighter than what is outlined by IHI for staffing a collaborative. Participation in an IHI-sponsored collaborative typically requires staff support at the participating clinic equivalent to one FTE. AAA provided resources equivalent to about one-quarter of that: support for a 0.15 asthma champion and 0.1 data entry person
- Geographic distribution of teams (local rather than national): AAA has a target area within King County from which clinics were recruited. Other collaboratives are regional or national in scope. This made it possible for closer interaction between sites, more connection to local community resources, and enabled more hands-on technical and personal support. However, it also meant fewer teams and less opportunity to learn from a wide variety of teams.
- Clinic readiness: Active recruitment of safety-net clinics in our target area meant that some teams may not have met readiness criteria that other collaboratives or improvement projects might require.

The LC was started in autumn of 2002. Four safety-net clinics in the AAA target area participated. Participation involved: 1) identifying a provider asthma champion and asthma QI team (nurse, medical assistant, medical records technician, nurse, etc.) to lead the project and participate in cross-clinic sharing; 2) designing and implementing Plan-Do-Study-Act (PDSA) care improvement cycles; 3) implementing and maintaining a CDEMS asthma registry; 4) providing spirometry for pediatric asthma patients; 5) senior leader support to ensure administrative buy-in for the activities; 6) participating in two 2-day structured Learning Sessions a few months apart and then meeting bi-monthly; 7) developing a plan for "spread" of activities; 8) submitting monthly activity and data reports to AAA staff; and 9) linking asthma patients to AAA Community Health Workers or other community resources.

Challenges Implementing the Initial Model of the Learning Collaborative

The initial version of the AAA Learning Collaborative was not as successful as hoped for a number of reasons, some related to implementation challenges, others to the time commitment required to implement the full IHI model. Interviews were conducted with LC participants; the following were the key challenges identified.

Challenges related to resources included:

- There were not enough resources (either time or expertise) to carry out a thorough planning process or to implement the LC as designed.
- Expectations were too high about what a Learning Collaborative experience could be relative to the level of resources available.
- Clinics have limited staff and financial resources and are pressured to focus on reimbursable activities. It is difficult for them to justify allocating time towards the planning and meeting time required by this intervention.
- Staff retention.
- Readiness of clinics.
- Uneven top management support.
- Being local, participants were inclined to respond to crises at their clinics and consistent attendance at bimonthly gatherings was difficult.

Implementation challenges included:

- More clarity was needed about roles, responsibilities, and purpose of the collaborative.
- The asthma registry needed to be in place prior to implementing the collaborative so that data could be available immediately to engage providers in the PDSA cycles.

Modified LC Model

The initial approach to training the teams was through 1 ½- to 2-day structured Learning Sessions a few months apart. However, these sessions were found to be too time intensive for participating clinics, and in June of 2003 that formal approach was replaced with a format requested by the participating clinics. The new format included bimonthly interactive clinic team gatherings. Six bimonthly team gatherings were held in 2004. In addition, at the request of the participating clinics, AAA agreed to extend support for a second year.

Lessons Learned

A number of lessons were learned in implementing the Learning Collaborative and other clinic improvement activities that may be useful to other community-based efforts related to chronic illnesses.

Program Design/Planning

- Assess which format and level of intensity is most appropriate, and provide adequate resources including leadership, staff time, and expertise for planning and implementation.
- Be flexible and modify the standard collaborative model to fit with the resources available and local context.
- Focus on clinics with a higher level of readiness. While difficult to assess, clinic readiness was a key factor for successful LC participants.
- If possible, have more teams participate to increase the potential for collaborative learning among teams and cross-clinic interaction can occur more readily.

Implementation

- Clearly communicate the purpose of the project and roles/responsibilities to all.
- Use terminology that accurately describes the activities so that false expectations and misunderstandings do not occur.
- Have a strong project leadership team in place.
- Engage senior clinic leaders often and regularly in collaborative activities.
- Have the registry up and running prior to starting the learning collaborative.
- Offer tangible services to participating clinics such as training or spirometers.
- Post monthly charts to help people see trends over time, about what is going on in a clinic, and to communicate with providers.
- Employ monthly progress reports to track and demonstrate progress.

Impact of the KCAF on the Learning Collaborative

Unlike other learning collaboratives, the AAA LC was closely connected to the King County Asthma Forum (KCAF). AAA staff worked on both the KCAF and the LC and clinic representatives were part of the KCAF. The following are benefits of being connected to the KCAF identified by LC participants:

- **Improved connection to community resources.** Typically the community domain is one of the weaker domains in the application of the Chronic Care model. The fact that the intervention was imbedded in a coalition approach strengthened the link with community resources and therefore placed greater emphasis on that domain.
- **Joint decision making about community programming.** The KCAF provides a feedback loop so that the LC participants can influence decisions that the KCAF makes about resources and priorities. It has allowed the clinical intervention to feed the design of other interventions, such as the Community Health Workers, and other provider education. This

made it possible to address asthma care improvement in the context of the whole local community rather than in one isolated clinic.

- **Facilitated access to resources.** As one of the clinic providers said, "We have gone from a place where you get your drugs to a resource for the community". The clinics have linked with ACT, Asthma Camps, CHWs, and the Seattle Asthma Program. It is likely that recruitment to these resources would have lacked coordination if not in a coalition context.
- **Improved information flow between CHWs and clinics.** A great deal of synergy occurred from having the Asthma Management Coordinator providing clinical back-up to the CHWs and coordinating the clinical intervention. Information was fed back and forth between programs to strengthen them both. For example, CHWs noticed symptoms that patients were having were not getting communicated to providers and this sometimes resulted in patients not being adequately treated. This information was then used as a topic of discussion at the bi-monthly gatherings of clinic teams: how to elicit information from patients in a short clinic visit.
- **Participatory coalition approach applied to LC.** The participatory nature of a coalition influenced the LC in the same way. Participants shaped the project.
- **Community awareness.** The KCAF members could help publicize the work that the clinics were doing; the clinics weren't doing it in a vacuum.

Further Dissemination of LC/Clinical Asthma Management Improvement Efforts

A number of other efforts were carried out to help disseminate the LC model, including:

- Presentation to leadership group-PHSKC. The project and results for one clinic were presented and the leadership group expressed intention to support planned care.
- Community Health Center organizations are spreading the efforts to other clinics--9 medical clinics and 5 school-based health centers.
- Newspaper articles and radio shows about asthma and asthma care improvement projects at clinics have been publicized.
- A large community gathering was held to celebrate and showcase successes.
- Two clinics intend to apply the chronic care model to obesity.
- Presentation was made to 40 PHSKC nurses on nurse's role in using the chronic care model for diabetes and asthma.

Learning Collaborative Summary and Comments from Participants

Four safety-net clinics used a modified version of the Institute for Health Care Improvement collaborative model to improve the quality of asthma care. Table 1 summarizes the differences between the IHI model and the AAA Learning Collaborative along several key dimensions. The AAA LC was smaller, with fewer supporting resources and more frequent but shorter and less-structured learning sessions. The approach to PDSA cycles was similar to the IHI model.

Table 1. Comparing IHI Model to Learning Collaborative Implemented by AAA

Characteristic	IHI Model	AAA LC
Number of teams	15-20 teams	4 teams
Clinic readiness	Meet criteria for readiness to change	Safety net clinics with varying degrees of readiness
Geographic area	Regional/National	Local (sub-county)
Resources	1 FTE (distributed across several positions)	.25 FTE (champion plus registry support)
Learning sessions	Three 1 ½- to 2-day structured Learning Sessions	Bimonthly, half-day interactive clinic team gatherings
PDSA cycles	Multiple overlapping cycles	Multiple overlapping cycles

Comments from Participants

Exit interviews were conducted with Learning Collaborative participants to identify accomplishments, challenges and lessons learned. The following are a brief summary of three key areas: changes producing the greatest impact on care, spread to other clinics, and most useful elements of the collaborative.

Changes producing the greatest impact on care. Areas identified by LC participants as being most likely to impact care included (quotes from interviews in italics):

- ***Asthma registry***
  The registry has had a huge impact. It is a great tool to keep track of patients.
  The greatest impact was the asthma registry. We're keeping track of our patients and getting them in for well visits. That was the biggest barrier from the patient point of view—they are not used to coming in well. It has made a big change in patient outcomes.

- ***Care guidelines***
  There has also been a great impact from spreading the word about asthma guidelines to MD's.
  (There has been a) clinic wide interaction on asthma—not just confined to doctors. Everyone knows what to do in their role.

- ***Community connections***
  I think the connections with community resources that (we were) able to make have a good impact.

- ***Sprirometry***
  (Another benefit was) the spirometry and spirometry training, and the "Living With Asthma" program.

Spread throughout clinic and system. Respondents were asked whether the changes brought about by the LC were spreading to other parts of their clinics and/or clinic systems. Two of the participating clinics said that spread was occurring:

> *The collaborative started with just the champion, then 2 doctors, and now all are participating. Almost all the nurses are trained. The whole clinic uses the forms and the collaborative's process.*

> *(The changes have been spread) throughout the clinic. In the next few months we'll begin spread to the system. Tacoma and Mt. Vernon are the next locations for the asthma registry and guidelines. We have been doing this with diabetes, and plan to do heart disease and obesity in the future.*

Most useful elements of the collaborative. The most often mentioned useful elements of the Learning Collaborative were:

- ***Bi-monthly meetings of participating clinics***
  The meetings of local groups were helpful. We heard about each others' challenges and successes, and were able to see that we are all committed to good asthma care.
  Bimonthly meetings were extremely helpful.
  Bi-monthly meetings were great to hear others' experiences.

- ***Financial support for improvement activities***
  Being able to pay the champion is good.
  The financial support was critical—this wouldn't have happened without it.

- ***Support from AAA staff and consultants (Marcia and Kathleen)***
  Marcia and Kathleen were everywhere and were helpful, knowledgeable and supportive.
  Marcia kept people focused. Providers would come up with excuses, we're too busy! And she reminded us what our goals are, she helped keep us proactive. She was in contact with us all the time…not just LC meetings.
  Marcia was key for this effort. Both she and Kathleen provided great support and information about how the collaborative works.

Overall, the LC was well received by participants, who were impressed with what they accomplished and how the LC supported them. As one interview respondent said:

> *This is, by far, the most successful of all the disease collaboratives (such as diabetes, hypertension) that I have seen. This one clearly makes a difference.*

Measuring Progress toward Clinic Improvement Objectives

KCAF has used a number of indicators to track the success of the Learning Collaborative and other clinic improvement activities. These include process indicators: establishment of teams, identification of asthma champions and holding meetings, as well as outcome indicators: changes in clinical practice and improvements in asthma care (e.g., reduction in symptom days).

Process Indicators

Table 2 lists the process objectives set out at the beginning of the AAA funding period, shows the degree to which they were accomplished and next steps after AAA funding ends. All four clinics participating in the LC identified Asthma Champions and participated in learning sessions. A subset of the four clinics established QI teams and created asthma registries. Two of the clinics participated in a more limited way: one clinic because of a lack of senior leader support and another due to a lack of readiness and staff turnover. In the two more successful clinics, many of the changes resulting from the LC will survive the end of AAA funding. In addition, three pediatric asthma "Evidence to Practice" presentations were made to 125 clinicians.

Table 2. Process Indicators of Success for Clinic Improvement Activities

Process objective	Status/Indicators	Next Steps/ Post AAA
Teams are established to engage in quality improvement activities	• 5 teams originally, one stopped participating • Individual clinic team meeting frequency: variable • Collaborative (i.e., all clinics) meeting frequency: bi-monthly	• All four clinics have plans (and 3 have dedicated resources) to continue the quality improvement activities
Clinic Asthma Champions are in place	• 4 Asthma Champions	• Continue support for asthma champions
Registries are in place and in use	• 4 clinics are using registries • 1 additional clinic added a registry and some QI activities	• Increase number of patients in registry • Expand scope and utilization of registry reports • Continue spread of registry use to additional providers
Learning Sessions and didactic team get-togethers are held	• 2 learning sessions followed by bi-monthly team get-togethers • 2002-2003 Avg. attendance: 16 • 2004 Avg. attendance: 13	• Learning sessions discontinued
Communication methods are in place	• Listserv established and in use • Monthly conference calls held through June 03 but were discontinued • Bi-monthly all-team meetings occurring • AMC coached over 40 providers from other clinics with CHW clients on asthma care practices	• Conference calls and all-team meetings discontinued
Health care provider coaching and assessment project is implemented	• Assessment completed at 3 sites • 3 pediatric asthma "Evidence to Practice" presentations to 125 clinicians. 5 scholarships to a Learning Collaborative participant to attend Asthma Education Institute.	• King County STEPS to Health will support some provider education.

Outcome Indicators - Changes in Clinical Practice

Over 60 concrete changes to clinical practice were reported by clinics to have resulted from the Learning Collaborative and other clinic improvement activities. These are listed in detail in Appendix A (Table A-1). Table 3 gives examples of key clinic changes and whether they were sustained, grouped by the six domains in the IHI model. Changes designed to improve self-management included setting goals during asthma visits and working to have asthma plans communicated to schools and pharmacies. Decision support was improved through monthly reports to senior clinic leaders. Implementation of the asthma registry was the primary clinical information system innovation. The community domain was enhanced by establishing linkages between clinics and Community Health Workers.

Table 3. Changes in Clinic Practice Resulting from the Learning Collaborative/QI - Selected Examples[1]

Domain (type of change)	Clinic change/Activity	Implemented successfully?	Sustained?
Self-Management	Self-management goals set during asthma visits).	Yes.	Yes.
Self-Management	Using Action Plans in different languages and sharing them with schools and other providers	Yes.	Yes.
Self-Management	Providers advising patients to show their action plans to the pharmacist at clinic pharmacy	Yes, although can't track when patients go outside of clinic pharmacy.	Yes.
Decision Support	Monthly reports to senior leaders, quarterly reports to leadership team	Yes.	Yes.
Decision Support	Received a spirometer and spirometry training	Yes.	Yes.
Decision Support	NHLBI guidelines posted in work clusters and integrated into asthma progress note template/registry form	Yes.	Yes.
Clinical Information System	Using the registry for scheduling, provider feedback, and tailoring interventions for patients	Yes.	Yes.
Clinical Information System	Use new database queries to determine effectiveness of care, conduct audits, assess outcomes, conduct follow-up	Yes.	Yes.
Delivery System Design	Asthma provider visits coordinated with education visits	Yes.	Yes.
Delivery System Design	Weekly asthma team meetings, including the Chronic Disease Coordinator	No. Weekly e-mails used instead	N/A.
Delivery System Design	Identified all charts of asthma patients with "stoplight" sticker for easy identification (	Yes.	Yes.
Organization of Health Care	Teams are "spreading" QI activities within their clinics, and to other clinics	Yes – in process:	Yes.
Community	Clinic teams link asthma patients to community resources, CHWs	Yes.	Yes.
Community	Making sure medication is available at school	Yes.	Yes.
Community	Continue to provide Asthma Care Training by AAFA and Educator on-site	Yes.	Yes.

Notes:
1 - See Appendix A, Table A-1 for a complete list of clinic changes, by clinic.

Outcome Indicators - Changes in Patient Care and Asthma Symptoms

Four indicators were used to see if the clinic changes translated into improvements in care for patients. They include three clinical process indicators and one clinical outcome indicator selected by LC participants. The primary clinical process indicators pertain to all childhood asthma visits in a given month and are:

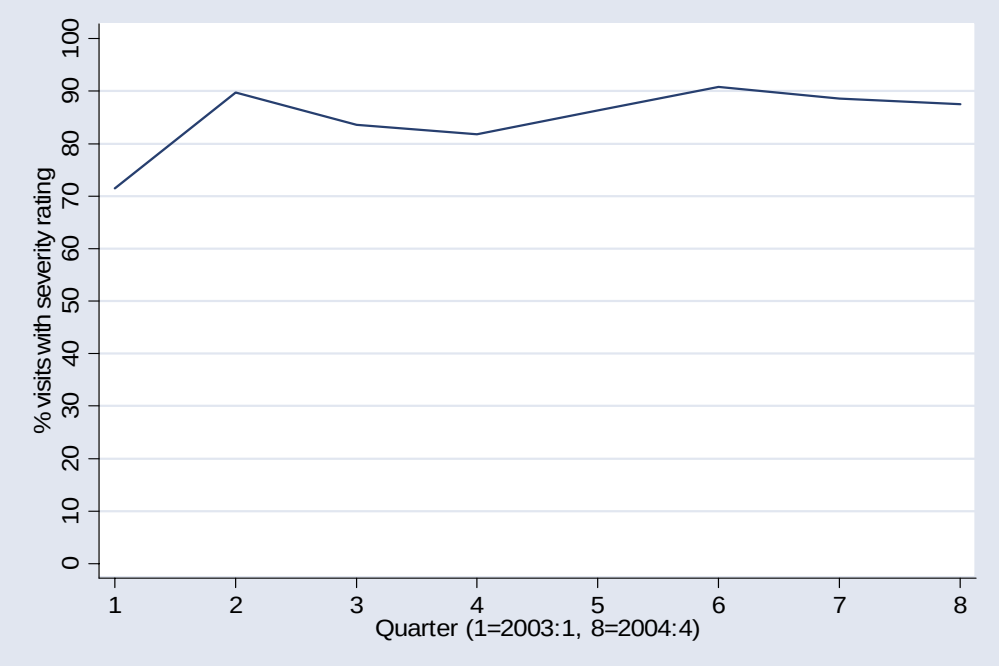
- Percent of visits in which an asthma severity classification was made (goal: 95%)
- Percent of visits for children with persistent asthma where anti-inflammatory treatments are prescribed or noted (goal: 95%)
- Percent of visits for children with persistent asthma where a current written asthma action plan is noted (goal: 95%)

The clinical outcome measure is the number of symptom-free days in the two-week period preceding the visit for children with persistent asthma (goal: 12 or more symptom-free days in a two-week period).

Figures 1-4 are plots, by quarter, of the four key outcome indicators for the clinic (Columbia) with the most asthma visits. Plots for the other two clinics (Sea Mar and Roxbury) along with a table with the quarterly indicator values are in Appendix B.

Figure 1 shows the percent of visits during each quarter from 2003:1 to 2004:4 (i.e., first quarter, 2003 to fourth quarter, 2004) with a severity classification recorded in the chart. Note that the initial increase in quarters 1 and 2 occurred during the pilot phase when the LC intervention (including the registry) was limited to a few providers. After spread occurred to the entire clinic, in the second quarter of 2003 (May/June), there was an initial decline in the percent with a severity classification that then returned to around 90% by the end of 2004.

Figure 1. Columbia: Percent of visits with a severity classification[1]



1 - Spread to all providers occurred in Quarter 2 - second quarter, 2003

Figure 2 shows the percent of persistent patients where an action plan was noted - either initiated, reviewed or updated-in the previous 12 months. The percentage declined from 85% in to 70% from 1st to 4th quarters 2003 and was only just beginning to increase at the end of 2004.

Figure 2. Columbia: Percent of persistent patients with an action plan noted

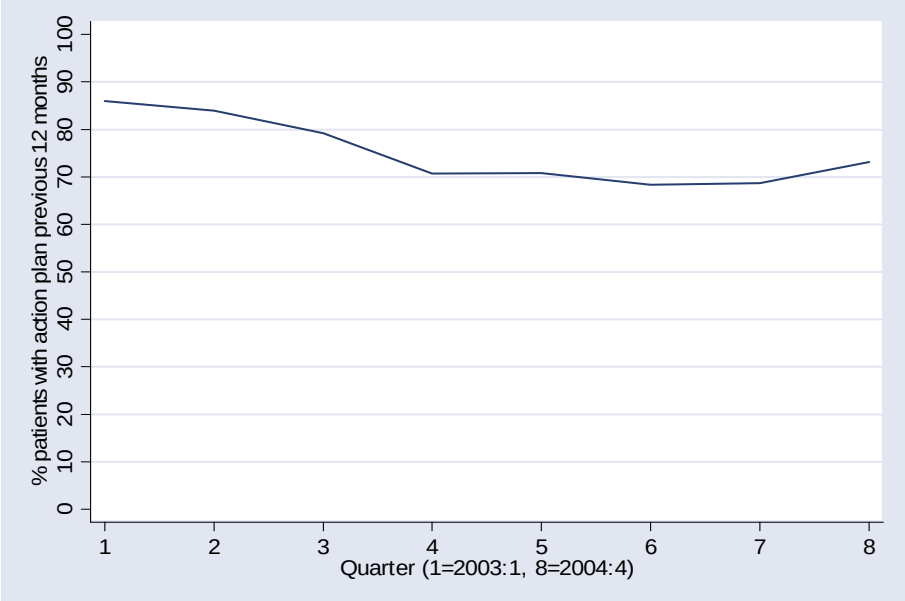
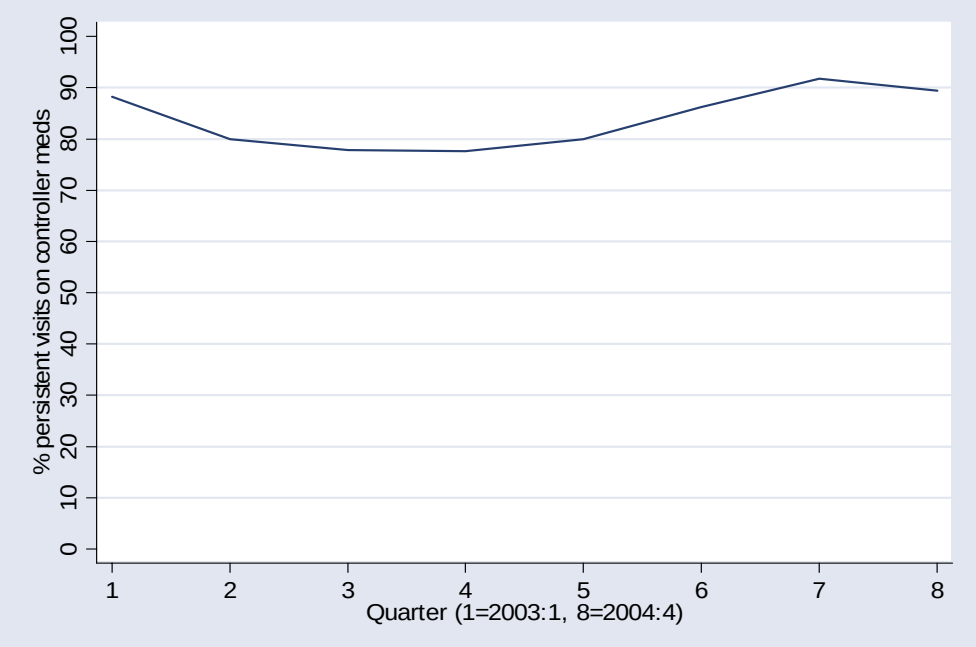


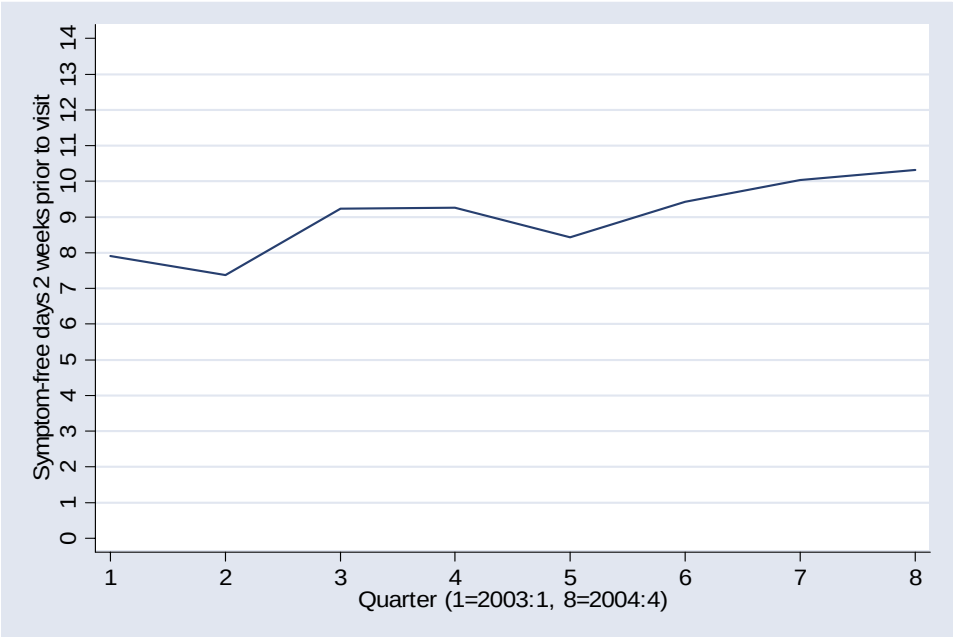
Figure 3 shows the percent of visits by patients with persistent asthma where the patient was on a controller medication. The percentage declined initially and then increased steadily throughout 2004, to roughly 90% in the fourth quarter of 2004.

Figure 3. Columbia: Percent of visits by persistent patients on controller medications



The number of symptom-free days (Figure 4) increased from eight (in the past two weeks) to nearly 10 by the end of 2004, still below the goal of 12.

Figure 4. Columbia: Average number of symptom-free days (past 2 weeks) among all patients with asthma



Appendix A - Complete List of Clinic Changes

Table A-1 provides a complete list of the clinic changes resulting from participation in the Learning Collaborative and other clinic improvement activities (as reported by the clinics). The table is organized by the six domains in the IHI Learning Collaborative model.

Table A-1. Changes in Clinic Practice Resulting from the Learning Collaborative/QI

Domain (type of change)	Clinic change/Activity	Implemented successfully?	Sustained?
Self-Management	Asthma education progress note used at visits (Sea Mar).	Yes.	Yes.
Self-Management	Providers advising patients to show their action plans to the pharmacist at clinic pharmacy (Sea Mar).	Yes. Can't track when patients go outside of clinic pharmacy.	Yes.
Self-Management	Self-management goals set during asthma visits (Sea Mar).	Yes.	Yes.
Self-Management	Using Action Plans in different languages and sharing them with schools and other providers (Columbia).	Yes.	Yes.
Self-Management	Assessment of family/patient asthma knowledge at each visit followed by teaching (Columbia).	Yes: up to individual providers.	Yes: up to individual providers.
Self -Management	CHPW helped us to get new action plans in multiple languages and for different age groups (Sea Mar).	Yes.	Yes.
Self -Management	Using "Asthma boxes", so patients have all their meds, equipment and action plan together (Sea Mar).	Yes.	Yes.
Self -Management	Received STEPS grant and hired bilingual (Spanish) Chronic disease educator (Roxbury).	Yes.	Yes: as long as STEPS funding is in place.
Decision Support	Monthly reports to senior leaders, quarterly reports to leadership team (Columbia and Sea Mar).	Yes.	Yes.
Decision Support	Bimonthly review of data and presentation to providers (Columbia).	Yes, though not felt to be helpful to providers. Still providing it to senior leaders.	Yes.
Decision Support	Received a spirometer and spirometry training (Sea Mar, Columbia, and Rainier Beach).	Yes.	Yes.
Decision Support	Posted "Asthma boards" throughout the clinic and updating these monthly (Sea Mar).	Yes.	Yes.
Decision Support	Using "talking points" handout to communicate educational topics (Columbia).	Yes.	Yes.

Domain (type of change)	Clinic change/Activity	Implemented successfully?	Sustained?
Decision Support	NHLBI guidelines posted in work clusters and integrated into asthma progress note template/registry form (Columbia).	Yes.	Yes.
Decision Support	Ongoing training of interim staff/residents in use of guidelines and the chronic disease management system (Columbia).	Yes.	Yes.
Decision Support	Received a spirometer and spirometry training (Roxbury).	In process. Limitations: many patients under age 5, up to individual providers, no RN on site.	Yes – with limitations.
Decision Support	Providers are using the NIH/NAEPP tri-fold (Roxbury).	Yes.	Yes.
Decision Support	NICHQ form printed in Spanish, Vietnamese, Cambodian, Russian, Ahmaric, Somali, with English on back (Roxbury).	Yes.	Yes.
Clinical Information System	Using the registry for scheduling, provider feedback, and tailoring interventions for patients (Sea Mar, Columbia and Roxbury).	Yes.	Yes.
Clinical Information System	Started asking providers and medical assistants to fill out an Asthma CDEMS form at all visits (Sea Mar).	Yes.	Yes.
Clinical Information System	Use new database queries to determine effectiveness of care, conduct audits, assess outcomes, conduct follow-up (Sea Mar).	Yes.	Yes.
Clinical Information System	Medical Assistant will check charts for completed form and return incomplete forms to providers (Roxbury).	Yes.	Yes.
Clinical Information System	Using the registry for scheduling, provider feedback, and tailoring interventions for patients (Rainier Beach).	Somewhat. Implemented its own registry and data entry sheet.	Yes.
Clinical Information System	Nurses/MA's asked to assist in flagging charts for data entry and to complete part of registry form (Columbia).	Yes, though reminders required.	Yes.
Delivery System Design	Centralized resources for providers about asthma education ("Asthma Toolbox") (Sea Mar).	No. People kept forgetting about it.	N/A
Delivery System Design	Centralized resources for providers about asthma education ("Asthma Toolbox") (Columbia).	Yes.	Yes.
Delivery System Design	Same day appointment policy to improve access for patients (Sea Mar).	Yes.	Yes.
Delivery System Design	Patients' charts have a chronic disease section, for asthma action plan and teaching plan, and self-management support flow sheet (Sea Mar).	Yes, though not using self-management flow sheet.	Yes.
Delivery System Design	Alert note in the MISYS system identifies chronic disease patients (Sea Mar).	Yes.	Yes. May spread it to other sites.

Domain (type of change)	Clinic change/Activity	Implemented successfully?	Sustained?
Delivery System Design	Asthma provider visits coordinated with education visits (Sea Mar).	Yes.	Yes.
Delivery System Design	Quarterly Asthma Day clinic asthma fairs and letters to patients during flu season to get patients in for planned visits (Sea Mar).	Yes.	Yes.
Delivery System Design	Weekly asthma team meetings, including the Chronic Disease Coordinator (Sea Mar).	No. Weekly e-mails instead since Chronic Disease Coordinator has other duties in Olympia.	N/A.
Delivery System Design	Green flow sheet for scheduling planned visits on Asthma Days in use, and was updated to include tools for classification and be appropriate for year round use (Columbia).	Yes. However, some use it sporadically.	Yes.
Delivery System Design	Identified all charts of asthma patients with "stoplight" sticker for easy identification (Columbia).	Yes.	Yes.
Delivery System Design	Identifying asthma/chronic disease patients using chart dividers (Columbia).	No. Under discussion.	N/A.
Delivery System Design	Implemented asthma week, and on "return to clinic" scheduling slip added 2 blanks: Reason for visit and preferred day to increase planned visits (Columbia).	Yes.	Yes. A similar event is planned for this fall.
Delivery System Design	Spacers are available for self pay patients (Roxbury).	Yes, though still looking for a distributor who will provide them for free.	Yes.
Delivery System Design	Chart review periodically to see if the persistent asthmatics are getting controllers (Roxbury).	Yes.	Yes.
Delivery System Design	Charts being flagged with a sticker and asthma note forms added at check-in (Roxbury).	Yes.	Yes.
Delivery System Design	Asking at visits if the child coughs when he/she is laughing and about the child's activity endurance when playing with other children (Rainier Beach).	No. Assistance from an outside provider was anticipated but not available.	No.
Organization of Health Care	Teams are "spreading" QI activities within their clinics, and to other clinics (Sea Mar).	Yes – in process: spreading to the other 3 sites in Seattle.	Yes. Joining the federal collaborative.
Organization of Health Care	Teams are "spreading" QI activities within their clinics, and to other clinics (Columbia).	Yes: Registry has spread to all other providers in the clinic and is at one other clinic.	Yes.
Organization of Health Care	Teams are "spreading" QI activities within their clinics, and to other clinics (Roxbury).	In process. Waiting on 2 other clinics. No computer technical support or funding for data entry.	No. Lack of funding.
Organization of Health Care	Teams are "spreading" QI activities within their clinics, and to other clinics (Rainier Beach).	In process. Spread to all providers in Rainer Beach clinic, and has started with other clinics.	Yes.

Domain (type of change)	Clinic change/Activity	Implemented successfully?	Sustained?
Community	Clinic teams link asthma patients to community resources, CHWs (Sea Mar).	Yes. Limitations: Spanish speaking CHW's.	Yes.
Community	Making sure medication is available at school (Sea Mar).	Yes.	Yes.
Community	Chronic Disease Coordinator participation in Sea Mar radio program (Sea Mar).	Yes- one time.	Maybe.
Community	Clinic teams link asthma patients to community resources, CHWs (Columbia).	Yes.	Yes.
Community	Screen registry for subgroups who may qualify for targeted interventions (Columbia).	Yes.	Yes.
Community	Making sure medication is available at school is incorporated into routine care (Columbia).	Yes: up to individual providers.	Yes: up to individual providers.
Community	Clinic teams link asthma patients to community resources, CHWs (Roxbury).	Yes. Don't always get to follow up with families.	Yes. For the most part.
Community	Continue to provide Asthma Care Training by AAFA and Educator on-site (Roxbury).	Yes.	Yes.
Community	Emergency department liaison (Roxbury).	In process. Limitations: communications with MDs.	Yes.
Community	Clinic teams link asthma patients to community resources, CHWs (Rainier Beach).	Somewhat. Limitations: language barriers.	Questionable: lack of funding.

Appendix B - Additional Registry Data

Table A-1 includes all of the data shown in Figures 1-4 above and A-1 to A-8 below. Note that Columbia had significantly more asthma visits than either Sea Mar or Roxbury where the numbers were relatively small. As the figures show, the use of controller medications and action plans increased at both Sea Mar and Roxbury while there were no clear trends in either symptom-free days or percent of visits with severity classification.

Table A-1. Key Registry Indicators, by Clinic

			Number of visits		Percent of visits with:			
Clinic	Year	Qtr	All	Persistent	Severity rating[1]	Action plan[2]	Controller medications[3]	Symptom-free days (2 wks)[4]
Columbia	2003	1	112	51	71%	86%	88%	7.9
	2003	2	166	95	90	84	80	7.4
	2003	3	281	140	84	79	78	9.2
	2003	4	416	192	82	71	78	9.3
	2004	1	380	190	86	71	80	8.4
	2004	2	389	218	91	68	86	9.4
	2004	3	314	158	89	69	92	10.0
	2004	4	320	180	88	73	89	10.3
Roxbury	2003	1	5	1	100	0	0	7.0
	2003	2	4	0	75	0	.	13.0
	2003	3	17	2	59	0	50	11.2
	2003	4	78	22	82	9	14	10.3
	2004	1	65	24	82	25	29	10.3
	2004	2	64	21	88	54	38	11.1
	2004	3	60	20	82	60	60	11.9
	2004	4	45	13	84	66	69	11.0
Sea Mar	2003	1	9	6	89	50	0	10.1
	2003	2	15	7	100	27	57	10.9
	2003	3	18	9	78	36	56	11.9
	2003	4	32	14	88	37	57	11.0
	2004	1	56	28	80	54	39	9.9
	2004	2	74	26	72	59	50	11.5
	2004	3	65	18	72	65	67	11.8
	2004	4	134	57	78	71	51	9.9

Notes:
1- % of visits each month among all patients with severity assessment
2 - % of persistent patients with action plan indicated in past 12 months
3 - % of visits among persistent patient on controller
4 - Average # of symptom-free days/2 weeks-all visits

Figure A-1. Sea Mar: Percent of visits with a severity classification [1]

1 - Spread to all providers occurred in Quarter 5 - first quarter, 2004

Figure A-2. Sea Mar: Percent of persistent patients with an action plan noted

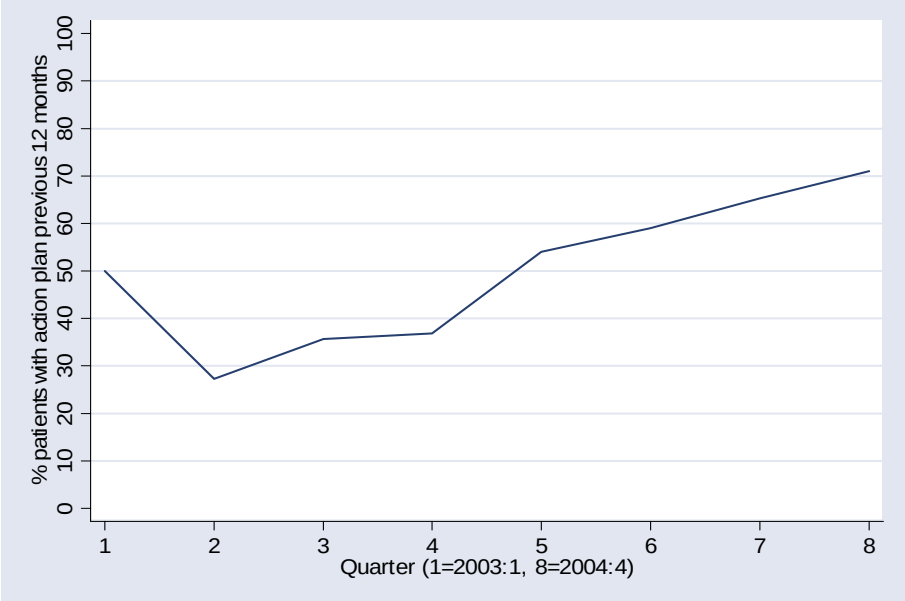


Figure A-3. Sea Mar: Percent of visits by persistent patients on controller medications

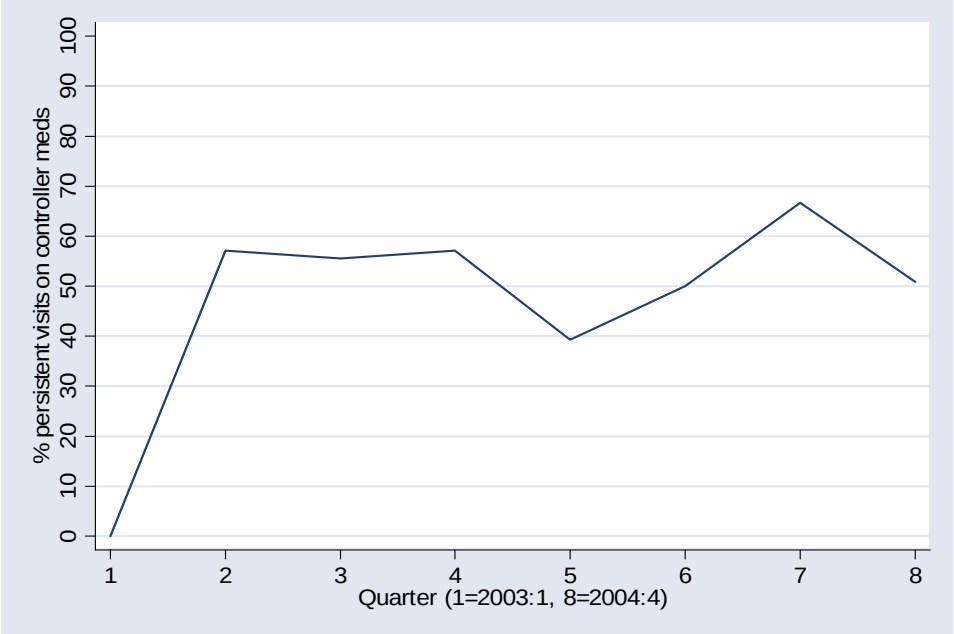


Figure A-4. Sea Mar: Average number of symptom-free days (past 2 weeks) among all patients with asthma

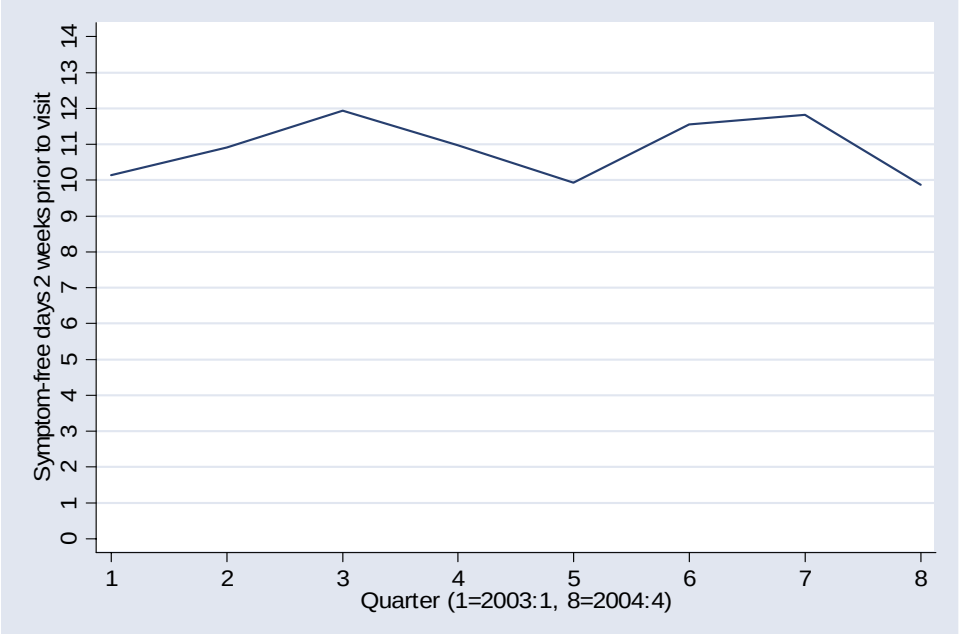


Figure A-5. Roxbury: Percent of visits with a severity classification

Figure A-6. Roxbury: Percent of persistent patients with an action plan noted

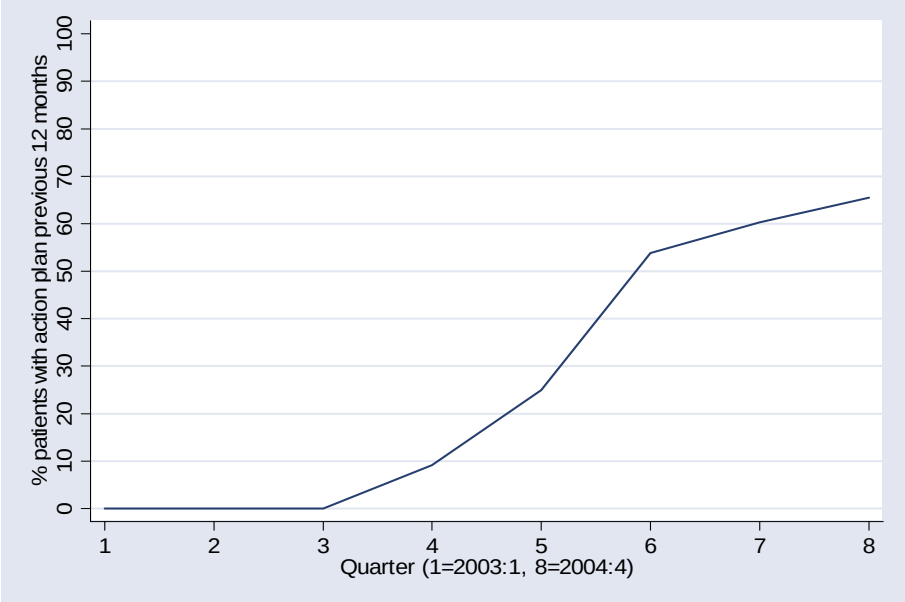


Figure A-7. Roxbury: Percent of visits by persistent patients on controller medications

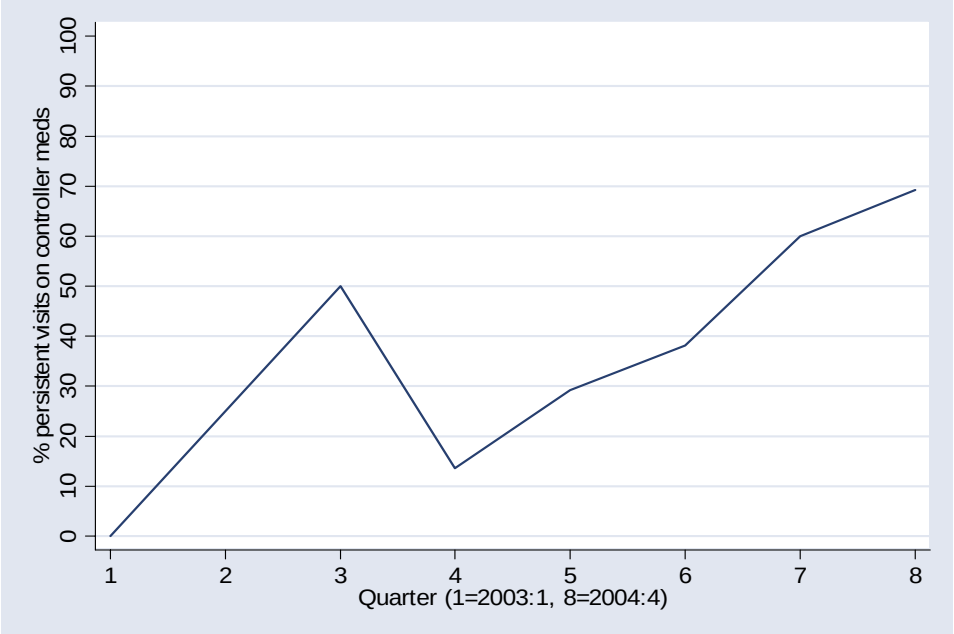


Figure A-8. Roxbury: Average number of symptom-free days (past 2 weeks) among all patients with asthma